Jacob Dowling: Hello, everyone and welcome. Thank you for joining us today. So, we're going to go ahead and get started. My name is Jake Dowling, I'm the account manager for commercial real estate, and our goal today is to provide you with an overview of the Better Buildings Alliance tools, resources and activities that will help you accelerate energy efficiency in your building portfolio.

Before we get started, I would like to address a few housekeeping items, we will be answering questions at the end of the webinar, but you may enter a question at any point through the question pane on the webinar panel on the right of your screen, and additionally, we've already had a question or two about this, but we will be recording this webinar and sending out the link to the recording as well as the slides following the webinar.

So, joining me to present today, we have Jen Singer from ICF International, who serves as the hospitality account manager, Sarah Schoen, who's the Better Buildings commercial sector lead at the Department of Energy, Deb Cloutier of JDM and Associates, the market solutions team lead, and Andy Mitchell, also of the Department of Energy, who's the technology solutions team lead.

If you have any questions regarding the information that we will review today, and it is not addressed in the question and answer session, please do not hesitate to reach out to your account manager or anyone listed on this slide for more information. To cover the agenda quickly, we will begin by having Sarah provide a few exciting Better Buildings Alliance updates followed by an overview of the market solutions team activities, and then we'll spend the remainder of the agenda discussing the technology solutions updates. I'd now like to turn it over to Sarah to provide some programmatic updates from the Department of Energy.

Sarah Schoen: Thank you, Jake. Just want to make sure that everyone can hear me.

Jacob Dowling: You sound great, Sarah. Thank you.

Sarah Schoen: All right. So first, just a reminder that the Better Buildings Alliance is a key part of the Better Buildings initiative, which was kicked off back in 2011 by President Obama in partnership with President Clinton, and BBA actually goes back to 2008, but it's not part of the bigger picture of Better Buildings Initiative.

And just to give a sense of the big picture, the potential for savings

is actually $80 billion if we cut energy use by 20 percent across US buildings, and I'll go to the next slide. So, the Better Buildings Alliance has members from across the commercial real estate market including hospitality, healthcare, higher education, retail food service, and grocery, and there are almost 200 members in the alliance at this point, and over 10 billion square feet of space.

So, as part of the alliance, DOE connects members with technical resources and provides a platform for peer exchange and members agree to participate in at least one BBA activity each year. I'll head to the next slide. So, there's been a lot of success and progress so far with BBA members and members report annual savings on average greater than two percent across their portfolios.

And we can move onto the next slide. Can we move on to the next slide?

Jacob Dowling: Did that work, Sarah.

Sarah Schoen: No, not for me. I can – anyway, while we're waiting for the slides to advance – oh, there we go. So, commercial real estate and hospitality actually make up the largest portion of the Better Buildings Alliance, so 59 members and over 6.5 billion square feet of space, so this group is crucial to the success of the Better Buildings Alliance, and we can go onto the next one.

So, every two years commercial real estate and hospitality members nominate a new sector steering committee, and we would like to acknowledge and thank the commercial real estate and hospitality steering committee chairs this year who are Chris Magee from MGM Resorts International and Marla Thalheimer from Liberty Trust, so thanks to them, and you can see the other members of the steering committee on this slide, and with that we can move onto the next one.

So, the role of the steering committee is to assure that BBA activities are meeting the needs of our members, so each year the steering committee sets a goal, and this year the goal is to increase membership by 600 million square feet, which is quite an ambitious goal, and we have two years to do that, but we need the help of all the members in the commercial and hospitality sector to reach that goal, so we're always looking to partner with you to spread the word about BBA and the good work that we're doing and to try to bring in new members.

So, we're always open to collaborating with you on that. If you

have any ideas or suggestions, please reach out and let us know. Another area we're focusing on it stakeholder engagement, and the third is making data actionable, and we're planning a peer exchange opportunity for December or maybe January, so keep an eye out for that, and we can move onto the next one.

So, encourage every member to join at least a team and as many as you like and have time for in order to help with your energy goals, mostly efficiency-focused, but also renewables as you can see on the top right. So, if you're in a space type or you have refrigeration or laboratories, lighting applies to almost everyone, so make sure that you get involved with those if you aren't yet, and we can go to the next slide.

And then there are resources developed by peers, so other Better Buildings Alliance members and then our Better Buildings Challenge partners, so the implementation models are some of the most valuable in that department, and they're all available on the DOE website, and we're going to send out the slide deck after the webinar, and it will have live links in it, so you can just click right through to any of the resources that you see here on this slide and take a look and check those out, so we can go onto the next one.

We also offer a webinar series and this one's highlighting the one we held back in September on building retuning, but they happen every month the first Tuesday of the month, and again you can click the Register link once we send out the slides after the webinar today, so take a look. Some great topics coming up, utility incentives and solar et cetera, so please keep an eye on those, and we'd love to have you join us one of the months or every month. Next slide, please.

And then our once a year highlight in-person educational opportunity is the Better Buildings Summit, which will be May 2015 here in Washington, DC, May 27th through 29th, and we want to make sure you all have that on your calendar and can attend and join us in person, so make sure to mark it down, and if you have any questions about it, please let us know or click on that link on the bottom of the slide here to see more details on the summit. Next slide, please.

Okay. And as always, there are plenty of resources on our website and pretty easy to find, but if you have trouble you can always, again, refer back to the slide and click the link and we can go to the next one. And if you're not already, we may have some interested parties on the webinar, we hope that you will become a Better

Buildings Alliance member, great network, great resources available, free of charge to any building that owns or manages buildings, so again, please spread the word or join.

And then just want to highlight one more time our Better Buildings Challenge opportunity, which is really a leadership position that any company can take, committing to an energy saving goal of 20 percent or more across your entire portfolio, and we do have some BBA members who are active in the Better Buildings Challenge, but if you are interested and you're not yet, please contact me, and my e-mail address is right in the slide, right here. And we can go to the next one.

So, please stay in touch with us, there are many ways to do that. We actually have a brand new LinkedIn group for all Better Buildings Alliance members, and we'd love to have you join. Again, click the link in this slide, or you can just search in LinkedIn, and we'd love to have you join us, and we're also on Twitter, and we tweet out success that our partners and members have with energy efficiency and we're even on Facebook, so you can like us there, and if you don't receive it, you can sign up for the Better Buildings Bulletin at the link at the bottom of this slide, but hopefully everyone on the call is already receiving that.

And we can go to the next one. So, we will be at the conferences on this slide in 2015, and great chance for us to meet members in person and connect with you in person, so keep these in mind, and if you're attending, please let us know and we will find you there or schedule a meeting ahead of time and we'd love to see you. We can go ahead. Okay. So, I'll pass it back for our market solutions team updates.

Deborah Cloutier: Great. Thanks so much, Sarah. Can everybody hear me okay? This is Deb Cloutier.

Jacob Dowling: I'm great, Deb. Thank you.

Deborah Cloutier: Great. Thanks, Jake. So, the goal of the market solutions team is to help our members identify non-technical barriers to energy efficiency and also to develop and deploy those solutions across your portfolios that can occur quickly and at scale. So, currently, the market solutions team is organized into these four focus areas, and they're really based on your feedback as to what issues are pressing or needs there are in the market.

So, the first one on the left-side there is leasing and split

incentives, and that group is focusing on leveraging that tenant landlord relationship in order to accelerate energy efficiency. The next one is the finance and appraisal group, and it is focused on building the business case for more investment in energy efficiency and really helping to look for ways where we can enhance the adoption of energy performance as well as incorporating the value into the building appraisal and valuation process.

The next one is the workforce training group, and it is focusing on ensuring that the market has skilled and qualified worker that are able to respond to the growing demand for and the ability to maximize energy performance of commercial buildings, and finally but not least, the data access focus group works with our members to develop resources and to share your best practices on how to engage with utilities in order to gain access to aggregated whole building data on a monthly basis for the purposes of benchmarking.

So, moving the next slide, I'll give you a little bit more of an update on each of these areas. In 2014 and in conjunction with the institute for market transformation and support from an amazing steering committee of more than 20 industry practitioners, the Better Buildings Alliance successfully launched the Green Lease Leaders recognition program, and this is intended to highlight those in the market who are successfully using the commercial lease on the way to create sustainable tenant, landlord relationships.

The program defines the term Green Lease by providing certain criteria and clauses that help to focus greater adoption of sustainable building management practices. The landlords and tenants, applicants for the award much show an executed lease or a collection of leases, that meet the criteria set forth by the program as well as submitting a narrative that describes their organizational approach.

So, at this year's Better Building Summit, we were very pleased to acknowledge organizations representing more than 400 million square feet of commercial floor space are the inaugural Green Lease leaders, and the 2015 application is now available, so you can rush out after today's call and check out the new application.

It looks very similar to last year with an expanded set of requirements for commercial brokers in order to earn the award. The team also developed several resources this year to help

organizations implement green leasing in their portfolio, including tips for energy efficient office build out, best practices for green leasing, and in collaboration, again, with the institute for market transformation we're able to develop case studies profiling the winners of the Green Lease Leaders Award.

You can find the application and additional resources on the greenleaseleaders.com website that's listed here, and in the coming year, the group is going to continue to focus on promotion of the Green Lease Leaders Program, but also to increase that engagement with tenants and occupiers of commercial space. We're really looking to further build the demand for energy efficient space.

So, moving to the next slide, I want to talk a little bit more about this increasing anecdotal evidence that shows the financial benefits of high-performing commercial real estate. It's seen not just in reduced operating costs but also in improved rents, vacancy, occupant productivity and sales prices, so yet too many investments in energy efficiency that have high rates of return and short paybacks are passed over and the real question is, why?

So, the BBA is currently working to identify additional opportunities to accelerate investment in energy efficiency as well as ways to encourage the commercial appraisal industry to consider energy performance and energy efficiency upgrades during the evaluation process.

DOE has funded the development of a research plan that is going to seek to identify those perceptions, or let's call them misperceptions regarding the value of investing in energy efficiency that may be preventing organizations from dedicating capital to upgrades, and this research will expand the growing body of evidence that demonstrates the financial benefits of an energy efficiency investment as well as help further build the business case.

DOE's also developing a training course this year for commercial appraisers, or in the coming year, and it specifically is going to build upon existing green training for appraisers by demonstrating how data tools, such as Energy Star's portfolio manager, the DOE building asset score, and the building performance database can assist appraisers in determining the value of energy performance.

Lastly, DOE's continuing to support the appraisal foundation's efforts to develop the competency guidelines for commercial

appraisers, and you may have heard about these competency guidelines, we are actually at the final exposure draft at this point, it is out for public comment. If you did not receive an e-mail from Jake Dowling earlier today, please follow up for more information.

Comments are welcomed by the appraisal foundation through December 12th, and it would be great to get our voices heard to help in defining these competency guidelines. Moving to the next slide, let's talk a little bit more about the building asset score. So, this tool uses a ten-point scale to evaluate the energy efficiency of commercial or residential buildings based on their physical characteristics and the major energy related systems in them.

It uses energy information about the building's structure and use, such as the number of floors, its lighting system, its mechanical components, its envelope, and using that information the tool is able to predict the energy use intensity, comparing it to energy simulation, and it generates a score on this ten-point scale, and it signifies the building's energy efficiency as well as providing recommendation for upgrades to improve that score.

So, the score enables a comparison among buildings' physical and structural efficiency and it's independent of operations and occupancy. DOE is currently looking for organizations to pilot the asset score and for more information please contact Andrew Burr, whose e-mail address is also listed on this slide.

Moving to the next slide, we are wrapping up – or just finished wrapping up this year, a really important research project which summarized the existing market evidence on the impact of green labels and energy efficiency and how that is related to the financial performance.

So, the team summarized and reviewed over 50 studies that demonstrated the connection between green labeled buildings and improved net operating income and asset value. While additional research is certainly needed, there is a growing body of evidence that suggests that green certified buildings impact things such as higher rental rates, higher occupancy, lower utility costs, can demonstrate increased sales prices as well as have low cost of construction premium.

So, the study is available on the Department of Energy's website, and the link is provided on this slide. Moving onto the next area, I wanted to share with you today, it's regarding the Better Buildings Workforce Initiative, which seeks to develop a skilled and certified

clean energy workforce.

So, there are numerous existing certifications available today related to energy performance and commercial building operations, but they have very disparate and varied requirements, and we see this resulting in a lack of clear evidence for a qualified professional to perform your energy efficiency related work and so the workforce initiatives collaborating with industry practitioners and the national institute of building sciences, NIBS, to address this barrier.

They're developing voluntary national guidelines that will improve the quality and consistency of commercial buildings workforce credentials for energy related jobs. So, the program is currently working with stakeholders, many of which – you all are Better Buildings Alliance members to develop the skills and standards as well as curricula and training, so it's a large undertaking, the initiative will turn to the Better Buildings Alliance members to help drive market demand for these new credentialing guidelines, so stay tuned.

Moving to the next slide, please. I'd like to share with you a little bit about the building retuning training. It was successfully piloted at a number of Better Buildings Alliance member sites this year. Over the past two years, over 130 building engineers across six cities received training on how to identify and correct operational problems, so these are really those low and no-cost measures that are holding back a great deal of our energy efficiency opportunities leading to wasted energy.

So, using the train the trainer model, the Department of Energy is encouraging its participants of these trainings to share and spread the best practices throughout their organization and moving forward the Consortium for Building Energy Innovation, some folks may previously know it as the Hub up in Philadelphia in collaboration with BOMA, the Building Owners and Managers Association are going to continue to offer the building retuning trainings across the country, and the next one is going to take place in San Diego in February of 2015.

So, the commercial buildings resource database lists additional building retuning resources and the PNNL offers an online training found at the link provided on this slide. So, finally, let's turn to the last slide in the market solutions section, Data Access. So, access to streamlined whole building utility data has been a major barrier for our industry in order to implement energy efficiency measures

really starting with establishing that baseline, you can't manage it if you're not measuring it.

The data access team has been working to inform the Better Buildings Alliance members about a wide array of initiatives aimed at facilitating access to building performance database – excuse me, building performance data. This includes working with the Better Building Alliance members to kind of articulate that critical role that data plays in energy management efforts and helping to communicate this need to entities such as the utilities and cities that may be in the best position to help facilitate access to the energy data.

One venue which will be important for our members to communicate their needs is the energy data accelerator, so this effort is a partnership between utilities, local government, and the Department of Energy in which the city utility pairs together and commits to providing whole building data to you all, the commercial building owners and managers and the energy data accelerator really provides a platform and a venue for these discussions to take place and to enable the utilities and those cities to understand the importance of whole building aggregated data.

So, we've already worked to author a letter of support from several of the members and this really is your statement or position about the importance of data and access to data and would very much welcome the opportunity to assist others who may be interested in sending a similar letter from their organization to the utilities.

And in 2015, the group will identify ways in which the Better Building Alliance members can continue to encourage utilities and cities to push to access and we really welcome anyone who's interested in continuing to be part of this dialog. So, with that, I turn it over to Andy Mitchell with the Department of Energy who's leading the technical team and ask for you to give us an update in those areas. Andy?

Andrew Mitchell: All right. Thanks a lot, Deb. Am I coming through okay?

Deborah Cloutier: Yes, you are.

Andrew Mitchell: All right. Great. So, as Deb said, now we're going to go and take a look at the technical side of the work we do on the BBA. Just to kind of take it high level, the role of the tech teams is to synthesize this whole wide world of technical innovations that are out there and available to commercial facilities and make those into usable

information for BBA members and all of your peers nationwide.

I mean, it's no secret to us in the BBA that the members are pretty much already leaders in the field, so the work that you do with these technical applications is work that's going to get copied and mimicked by other business out there in the nation and internationally as well.

So, there's a lot of technical progress going on, and there's a lot of opportunity to implement energy efficiency measures, one of the things we often hear from members is that prior to joining the alliance, their primary source of information is sales reps for companies that are promoting a certain good, and that's a good thing, and there's certainly a role for that, but those reps are central to the deployment of new technology.

But if you think about it, it's one of those situations where if you ask a hammer salesman to recommend a good tool for a job, they're probably going to recommend a hammer, and our role here at the BBA tech team is to be an objective source of information, so to take a look at the problems, the possible solutions and just solutions both from peer to peer and from our own experts.

So, the technologies that we choose to address in the tech teams are determined by input from BBA members as well as our own prioritization of high impact technologies and collaboration opportunities with our partners. There are eight tech teams, and we'll go through those in a minute here.

They're divided by category of application or industry, and each of the teams is led by a subject matter expert from one of our national labs or from Navigant Consulting. So, I'm going to go to Slide 28 and just take a look at another aspect of the tech teams, and that is real building demonstrations or tech demos.

Many alliance members are demonstrating new, innovative energy-saving technologies through real building demonstrations. These tech demos are an opportunity to try viable market-ready and cost saving technologies by working directly with manufacturers, DOE and national experts.

Tech demos provide members with a chance to achieve next generation energy savings and gain recognition for innovative approaches to energy reduction with third party expertise. So, I'm going to just go through these three real quick, and please keep in mind that we're looking for sites for these demonstrations.

There are advantages, it's kind of a shared opportunity and I would just ask that everyone consider whether or not any of these would work at your facility. The first one is partnership with enVerid, HVAC load reduction, and this is an ideal application for commercial real estate retail.

Originally grew from a carbon sequestration project, and it's a demonstration that reduces air recirculation in buildings and takes advantage of a membrane technology that reduces the amount of outside air an HVAC system needs to condition while still maintaining higher standards.

So, depending on the activity in a building, you can think about the air handling systems will always be pulling in some amount of outside air and when they do that they have to either heat it or cool it to match whatever's going on in that office or that mall or that medical facility, and that takes a lot of energy to heat or cool that air.

So, even when the outside air – so, the technology allows the building to use less of the outside air and more already conditioned inside air. It's a pretty straightforward reduction in energy. What the membrane DOEs is, it removes volatile organic compounds and carbon dioxide from the existing inside air, so the recirculated air is fresh, and it thereby allows the facility to use less outside air.

The preliminary demos showed 20 percent cooling energy savings, so we're looking for host sites that can – that are looking to reduce their HVAC load and do not have medical air or recirculation requirements. Next item on this list, Building IQ Predictive Energy Optimization. They're already partnered with GSA and District of Columbia.

What we're doing is looking for larger enclosed areas, over 100,000 square feet, and it will implement digital controls that analyze power savings, reduce demand charges, use predictive modeling to account for weather info occupancy. The preliminary demo shows 70 percent average HVAC system savings. So, again, key criteria there is over 100,000 square feet.

Last one is A.O. Smith, micro combined heat and power. This is a technology that's generally reserved for large, in some cases massive, facilities, universities, hospital campuses that combine heat and power to both heat water and generate energy. There's new innovative technologies out there that make these miniature or

micro CHP units and really the primary criteria there is that the facility needs to have high hot water heating needs, so 3,000 gallons a day.

There's also some regional criteria there that depends somewhat on local subsidies and local climate. Ideal partner for that would be larger full-service restaurant. So, I'll go to the next slide, Slide 29, and this is basically a save the date. We want to get input on envelope retrofits, so this is an upcoming tech demo, and we are going to convene in the Smoky Mountains at Oakridge National Lab this spring.

We're hosting a workshop that's intended to bring together building professionals with envelope stakeholders to advance window, wall, and roofing retrofit technologies, envelope technologies. They're currently underutilized or in need of more development to drive down costs and ease installation.

So, the point of this event it to get perspective on how we can move toward real-world solutions that can be cost effectively installed on multiple building applications. Please consider joining us. More news on that to follow, you can certainly contact me personally if you have questions.

Next slide is Slide 30, and we want to take a look at an actual results from one of these tech demonstrations that we did with multi-load laundries. So, multi-load laundry is kind of an interesting technology. It's one that sort of crosses over from industry to commercial. Very important, obviously, for hospitality as well as some other facilities like elder care that are doing tremendous amounts of laundry.

So, we have three sites for the multi-load laundry demonstration. The Grand Hyatt in Seattle, Charleston Place is a ____ hotel in South Carolina, and the Rogerson House in Boston, Mass is an elder care facility. You can see that the facilities are pretty different, and the technology that they implement is a little different too.

The Grand Hyatt shows significant water savings, modest water heating energy savings, but a great payback of less than a year that included the utility rebate. Charleston Place Hotel also – I'm sorry, to back up, Grand Hyatt, the technology they were using there was waste water recycling.

In Charleston, they showed significant water heating energy

savings and that led to a simple payback of under three years, not bad. The Rogerson House on the other hand is a much more interesting case. The energy that was needed to do all this laundry was reduced by 63 percent, but water use actually increased by 19 percent because the vendor wasn't sure about the proper setting.

So, it's really a great lesson in the real-world implementation of these measures. Good savings are possible with ozone laundry systems, they're not assured, and the customer and suppliers have to be aware of the implications to changing wash cycles. So, I think the Rogerson House example is really just – demonstrates that we're kind of playing chess and not checkers with some of these technical demonstrations.

While there are significant savings available, it DOEs take some doing, and it goes back to what I was saying about workforce training, but that's why we do these demos, that's why we learn these lessons, that's why we make them available to the BBA. The reports can be found, they're at the bottom, and just to reiterate what Sarah said earlier, when we send these slides out after in PDF, you'll be able to click on all these links, so no need to take down notes now.

Next slide is 31. What I'm going to do now is go into the different tech teams, so there are eight of them, we're just going to focus on five today because that's more relevant to commercial real estate and hospitality. The first one is lighting. So, lighting, as probably most people know, is a high profile and high value energy efficiency measure.

It makes a first impression to people when they're visiting your facility, and I can say from experience that to some extent, facilities are judged on their energy efficiency by that lighting. It's kind of that indicator, that canary in a coal mine. If you walk into the lobby of a building, you can see that they're running obsolete T12 linear fluorescents, they probably don't have a very advanced energy management policy.

So, the other tech teams are probably a little jealous of lighting because it lights up, it literally is the bling of energy efficiency, and for that reason, we've put a lot of emphasis on it. The major emphasis in the last year – I'm sorry, I should back up. Its technical lead is Linda Sandahl. She's based out of Portland, Oregon, and she's a wonderful asset to this team, and a great resource.

She's been a great leader on the LEEP campaign, Lighting, Energy Efficiency, and Parking. It's been a highly successful effort to influence the uptake of lighting and energy efficiency in parking. So, back to that concept of people coming up to your building, and what is the first thing they see but a beautiful, glowing, highly efficient modern parking lot.

It's a great way to make a first impression. It also has incredible payoffs. If you look at that graph on the top right of the slide, it's small, but I think you get the picture there. I mean, that is – what we're tracking there is participation in the LEEP campaign in terms of millions of square feet, and you can see that it is going up and to the right, which is a very clear trend, and I wish that all the trends in our projects looked just like that.

Energy savings, just to pick out some of these points, energy savings can be as high as 90 percent at some sites and also incorporate significant maintenance savings. Probably many of us know, LEDs have a long life, so once you install them, you don't need to change them out as often, and particularly for highlights in parking areas that can be expensive to change out, that's a major advantage.

The 90 percent reduction comes from new technology and controls, so those projects that take full advantage of both. The award winners in the LEEP campaign that we've recognized so far have not used LED exclusively. Big savings come from controls also, so that's things like daylight sensors, occupancy, if anyone is ever in Denver, the parking facility at the National Renewable Energy Lab is a pretty spectacular example of that.

Basically, there's a lot of different approaches to instituting that high efficiency DOEsn't necessarily have to be LED, it could be a combination of fluorescent and induction technology with controls, basically as one of the managers of the program, Michael Myers, said the equipment can really only get us so far, after that you have to start changing behavior, start controlling it.

And that's the theme that gets echoed throughout all of these tech teams, and really throughout all the work we do in the BBA that there's – it's one thing to have a widget to lower your energy use, but we do need that buy-in and having that controls aspect is part of that.

So, moving on to current activities. Updates to the BBA lighting specifications are underway, we're going to update to reflect new

IES recommendations and make improvements based on what we have learned in the LEEP campaign. So, for example, many sites are far exceeding the minimum levels required in the current specification, so we're going to set the bar higher.

Participating in that and you can do that by providing your input to Linda, her contact information is above, it's your chance to influence what the campaign recommends in terms of lighting performance, and that will be copied. Again, that will be mimicked and will become at some point, probably a standard for performance, so what we're looking for there are success stories that might help others overcome barriers, a challenge that prevented you from accomplishing your goals, and it's basically your chance to step up.

Step up and contribute to the cause, help your country use less energy, free up more capital, create less pollution that's kind of the point. Let's see, Upcoming Opportunities, this is one sort of early warning here. The Interior Lighting Campaign, or ILC, we're going to build off of the success of LEEP, and we're going to start ILC in March 2015.

And this is something that you can keep an eye out for, it's upcoming, it's your chance to be an early adopter, but basically what you're going to do is focus on troffer lighting and 3D troffer lighting retrofits, indoor spaces, so that's going to apply very much to commercial real estate.

Let's go to the next slide, 32, and Sarah mentioned before too that renewables integration, although not technically efficiency in the strictest sense is very important and one that is important to a lot of our members. The big highlight for 2014 is publishing the Photovoltaic Decision Guide, which was really the impetus for creating the team, and that was based on feedback from the 2013 BBA summit. I think that was Sarah that mentioned the upcoming summit at the end of May. This will be another chance to give feedback.

But that solar decision guide is out, it's a great resource, and it is – again, it's linked here on this slide, you'll be able to click through once the PDF is in your hand. So, Current Activities, we're developing a sector-specific solar decision guides. Basically, we're breaking down that 40, 50 page PV guide into smaller usable quick guides that sector specific interests can use.

So, we'll have one specifically for commercial real estate,

specifically for hospitality and so forth. For the commercial real estate PV guide, the feedback we have gotten, or one of the interesting pieces of feedback we've gotten so far is that the interaction between solar installation and roof warranty and repairs is a concern.

So, we plan to address that in the guide, and that's just an example, we may even have that as sort of a breakout fact sheet so that we can address that head-on. We've heard that that's a concern. So, if anyone has input or experience with solar installations on the roof and how that interacts with your roofing operations and maintenance, please reach out to myself or Jay Paidipati who is listed at the top, he's our technical lead based out of Boulder, Colorado and with Navigant consulting.

Also in Current Activities, leasing guide, this goes back to what Deb was describing with split incentives. We're addressing that specifically for solar installations on rooftops or anywhere for that matter, but the leasing guide will address split incentives and working with the market solutions team.

It's really a fascinating problem. It's got agency issues, it's something there's no silver bullet for, but it's a real opportunity for collaboration across traditional commercial real estate roles. Upcoming Opportunities, this is a good chance to promote a meeting on December 2nd.

This will feature Andy Walker from NREL, the National Renewable Energy Lab, and he'll be addressing best practices for operation and maintenance. So, that's going to relate to facilities that already have installed solar, so take a look at that. That's listed on our website.

So, one way to get involved is to give us a case study, anything we can use to spread the word to other members as well as other people nationally. And then finally, Plans for the Future. In the near term, we're focused on these solar decision guides for sectors, but come spring we're leaving the docket open, so we'll be able to react to member interests and new emerging technologies.

It might still be solar, but I just want to emphasize that we're available and listening for input. Next slide. I'm on 33, and that is the space conditioning team, so HVAC and more. The technical lead is Michael Deru. He's also based out of the National Renewable Energy Lab.

2014 highlights. We're going to focus primarily on the advanced RTU campaign, or ARC, arc, which surpassed 30,000 high efficiency RTUs, which is fantastic. Over 300 gigawatt hours and saving $33 million annually. These are great numbers and these are numbers that attract attention.

Unfortunately for rooftop air conditioning units, RTUs, they don't light up, so they don't get as much recognition, say as parking lot lighting, but nonetheless, the ARC, Advanced RTU Campaign has been a great success. Certainly still looking for people to join if you have rooftop units for air conditioning, check out the website listed there.

Just released some new resources on that, and then just yesterday actually there was a webinar promoted by ARC, and we had a representative from the Adidas retail stores, Kirk Beaudoin, who gave a great overview of the process that Adidas went through to have advanced RTUs installed on their facilities or to be installing them ongoing.

He gave some great color on his own motivation and the challenges and success he's had working internally at Adidas, and he makes a great case for replacing RTUs before they fail, or proactive replacement, which is one of the resources we have listed in the new resource category.

There's also a great overarching case study on the Adidas experience readily available. Again, you'll get these hyperlinks active when you get the PDF. Current Activities and Other New Resources, Advanced RTU campaign continuing through 2015, so nominations for participants for recognition, we give awards.

Again, RTUs don't light up, so recognition is critical, the occupants in these buildings, if all goes well with these advanced RTUs, they don't even know anything changed. The air is still cool, the air is still warm, they may or may not be aware of the energy bills going down, so, those awards are critical and those categories will be announced in January.

Two other, real quick, two other resources that are available on there, Best Practice Guide for RTUs, basically as a way to estimate the performance of older installed RTUs in HVAC systems and resource map is a great primer on the systems view of central HVAC plans, distribution systems based conditioning load, so a good intro if you are familiar with or if you're not familiar with HVAC systems and want to get more so.

Next slide is 34, and this is Upcoming Opportunities, coming up we have a peer exchange for energy savings opportunities for ventilation. Kind of just throwing that out there as a early warning. We'll have more info on that coming up, that'll be probably late winter, early spring.

Two technical guidelines coming our way that could change the way HVAC is installed and operated, the optimal air system control sequence coordinating with Ashrae, quick overview on that. This is ideal control sequences. It's for facilities with hundreds of air handling units that need to be coordinated.

I mean there's plenty of stories of units cycling on and off, one unit being overworked and another one not working at all. The working unit is blown out, basically it DOEsn't optimize the resources we have, so Ashrae's coming out with a guide. That guide should be very advanced, very technical, and for that reason we are very fortunate to have Dr. Deru distribute and provide guidance on the document.

We may get direct support from Ashrae, maybe a webinar or other materials, but nonetheless, this will be a very important and very technically complicated document, so we're looking forward to having guidance on that. Well drop down to the ventilation best practice guide for retail.

I think that's certainly something that's a document that will be of interest to retailers, obviously. But, balancing indoor air requirements with energy optimization, different optimization for different settings. Obviously, something like an office in a school will have different air requirements than retail.

Retail, depending on what it is you're selling, can have different contaminants and different concerns than other applications, so any business that sells furniture, clothing, anything with fabric will experience off-gassing and having some ventilation best practice guide will be a big help.

Last point there, recruiting sites to participate in the demonstrations. I mentioned these earlier. The enVerid HVAC load reduction, and the A.O. Smith micro CHP. Next slide is 35, and this is plug and process load team. This was explained to me as – what is a plug and process load? If you took a building, and you're a giant of course in this scenario, you're a giant, you pick up the building, and you shake it, everything lose that falls out of the

building, that is part of your plug and process load.

And it's often the last thing that gets tracked. Our plug and process load team is led by Rois Langner, she's at NREL, and 2014 highlights, completed and plug load study in healthcare, so that is available, you can see the link there to click on it, focus areas were Massachusetts General Hospital and SUNY Upstate Medical University.

And basically what they were doing was focusing on the nighttime idle modes of different devices. This is the often referred to as the vampire load with the electronics and all the electronics staying on all night. There's a list of publications there that have come out over the course of the year, the links are available on the PDF.

And then finally the Advanced Power Strip Technical Specification and is pretty simple. Pretty simple document about four pages of actual text, and that will be a very good resource for anyone who's in an organization that's considering a large scale purchase of advanced power strips, so these are power strips that can incorporate in those nighttime idle modes, more intelligent use of plug loads. So, that document is in draft and should be out soon.

I'm on Slide 36, Current Activities, basically we're promoting the use of advanced power strips and use of APS technical specifications, so that's ongoing. NREL working with building owners, manufacturers and potentially utilities to promote those standards and plug load solutions.

The how-to guide for installing APS, a little bit more complicated than just plugging them in, so that how-to guide is forth coming. It will include things like deploying it, educating your workforce or anyone using it. Another chance to promote the upcoming project team call just in a couple weeks. Quarterly call scheduled for December 3rd, and you can contact Rois Langner to join the call, her e-mail is above. It will also be listed on the BBA website under the Events section.

So, Plans for the Future, we keep an eye on this, Rois took over leadership of this team, and is planning a real big overhaul of the website, so we're looking forward to that. Let's go ahead and jump to the next slide, Slide 37, EMIS. The technical lead for this is Dr. Jessica Granderson at Lawrence Berkeley National Lab in California.

2014 Highlights, basically 2014 for the EMIS team was a lot about getting members all on the same page, about what it means to participate in EMIS, to have EMIS systems and basically to level the field so that moving forward in 2015 we can focus on more nuanced applications.

So, across this collection of resources, basically the point is to come to a common understanding to the extent that it's possible. You'll see on all these resources are very introductory, they're very high-level, and very useful. Energy Management Information Systems is kind of a new, newer I should say, newer technology and it's overarching.

It's one that people kind of recoil from a lot. It seems like you're biting off a lot when you start taking an interest in that, but the potential is very high, and these resources that the EMIS team has put out are very useful. The resources were informed by previous year's summit, and the two sessions we had there.

So, again, another plug for the BBA Summit coming up at the end of May. Highlight, I guess I would point out the first link there, the Webinar, this crash course, again it included high level stuff, sort of establishing a more intentional process to selecting, adopting, implementing an energy management information system.

It took a look at the broad level cost and savings and basically makes for an excellent starting point. Other highlights, in the team calls, the EMIS team, they actually were able to demonstrate various EMIS systems with vendors, and that's going back to the idea that vendors and the sales reps have a lot of info to share with us.

The EMIS team embraced that and invited those companies to come in and demonstrate their products in a more objective environment. The products were selected according to member interest, the ability to be easily demonstrated in a call like that, and criteria for capabilities.

The last point here is just recounting that the team has been ongoing tracking member participation, all the members are pretty active, and actively looking for ways to maximize values from their EMIS system. Some of the stars there include GSA, Whole Foods, the County of Kauai out in Hawaii, Wendy's restaurants, and more.

I'll go to the next slide, Slide 38. Chance to Promote a Joint Sector Webinar with the retail and food service sector. Coming up on December 9th, definitely encourage all industries to attend, not just retail and food service, there's a lot of crossover lessons with EMIS, and all span different building types.

So, I'm going to skip down to the last – I realize we're running short on time, so I'm going to wrap up here, the last feature point that I want to focus on there at the bottom of the primer, that'll be a product that will focus on incorporating the energy data into overall organizational integrations.

This is something that the commercial building integration office where I sit is focusing on. So, not just one device to improve efficiency, but a more holistic way to integrate into overall organization. It's no small task, but it's one that can certainly have a profound effect on energy use when the data becomes important to everyone not just the engineering department or accounts payable department. So, sort of a broad stroke but an important one.

Upcoming Opportunities, I mentioned earlier the tech demos with Building IQ. So, there's three more teams, we're not going to focus on those today, but certainly happy to talk about them if anyone's interested, the food service technology team, and the labs team focuses on technology specific to those industries as well as refrigeration, which is obviously important to many industries, particularly grocery.

So, that pretty much wraps up the tech teams, I just again want to point out that the materials are all available on the website, you can access it through clicking the links on this, or it's a pretty quick Google search, Better Buildings Alliance, you'll find tech teams listed under activities. So, with that, I will hand it back to – Deb, are you going to take it back, or who shall I pass it to.

Sarah Schoen: This is Sarah, so –

Jacob Dowling: Thanks, Andy, I think –

Sarah Schoen: – we can move – oh, we can move onto Q and A. Did you have something to add, Jake?

Jacob Dowling: Nope. I was just going to turn it back over to you. Thank you.

Sarah Schoen: Great. Okay. *[Crosstalk]* So, we have received some questions already, and I can move to those, but we'd love to get some more, and we will keep tabs on all the questions that are coming and I will just jump right in here.

So, just to clarify about the links, while we're in this GoToMeeting format online, the links will not be live or clickable through the window, but after the webinar ends, we will send out a PDF version of the slides and the links in those will be active and live, and you can click through from those, so just keep an eye on your e-mail, and you should be able to access everything that way.

And when we send out an update after the webinar, we will also include a recording of the webinar, so that will be available to everyone who has joined us today, and to anyone else that wasn't able to make it.

And before we jump into other questions, I just wanted to let people know that if you need to leave at this point, that's no problem, feel free to hop off the webinar, you can always catch the Q and A on the recording, but don't feel like you need to stay, we're actually right at 2:00 here, so thanks for joining us, and if you'd like to stay on for the questions and answers, please do. We will continue with them, but thanks again for your time.

So, we'll send out the slides and the recording after the webinar, and then we have a question here for Deb. So, Deb if you are available, I will read the question and then pass it for you for an answer. The question is from Jose Solis, and the question is, how much has the market solutions team focused on market solutions that target Class B and Class C commercial office space, especially with regards to split incentives? So, great question, Jose, thank you.

Deborah Cloutier: Thanks, Sarah. This is Deb. It is a tremendous question because, as we know, most of the market up to this point a lot of emphasis has been Class A space and that's where there's more demand from tenants. I would say that all of the activities that we're focusing on within the market solutions group takes into consideration all asset types and classes, so office, multi-family, retail, hospitality.

We try to understand how the barriers exist for those particular segments as well as Class A, B, and C in those secondary and tertiary markets for split incentives and things like Green Leasing, it's completely applicable to Class B and C space, and actually we had several of the folks that applied for and were recognized are

putting these practices in place in those – in Class B and Class C space.

But then also, if you think about the tenant has to be open and interested in having a discussion about making improvements in their space to reduce their total occupancy costs and for Class B and C property, the percentage of the occupancy costs which covers operating expenses can actually be a larger percentage relative to the overall occupancy cost because the rents are lower.

So, I think the concepts apply, and we need more case studies and more examples of where it's successfully been implemented to try and help get those messages out to other Better Buildings Alliance members. So, if you have some specific ideas or successes, we would love to hear about them or try to help you foster them further.

Sarah Schoen: Great, thank you, Deb.

Deborah Cloutier: With that I turn it back over.

Sarah Schoen: Sounds good. This is Sarah, and thank you, Deb. I would just add that – Deb already kind of said this, but if there are specific ways in which you would like to see Class B and C space addressed that we haven't yet done, please let us know, 'cause we're always open, as Deb said, to ideas and ways that we can improve our programs.

So, we can actually head back to the technology updates at this point, and we have a question about the building IQ demonstration for Andy, and the question is, if you can please repeat the piloted savings, was it 70 percent of total building energy use or just of the HVAC energy use? So, Andy, if you could jump in that would be great.

Andrew Mitchell: Sure. I'm just pulling up my notes here. Sorry, can you give that to me one more time? What was the specific *[crosstalk]* they were looking for?

Sarah Schoen: No problem. The question is whether the – what the amount of the piloted savings was and whether that figure, it may have been 70 percent was of the total building energy use or just of the HVAC portion of the building's energy use, 'cause that number sounds pretty impressive.

Andrew Mitchell: Yeah, great point, one seven percent of HVAC system savings.

Sarah Schoen: Seventeen percent. Okay.

Andrew Mitchell: Yes. Thank you for clarifying. Whoever asked that question, thank you for clarifying. One seven percent average HVAC system saving from the predictive modeling.

Sarah Schoen: And that's just on the HVAC portion of the energy use, not the entire building energies?

Andrew Mitchell: Correct.

Sarah Schoen: Okay. So, not quite as high as 70 percent, but still significant.

Andrew Mitchell: No, 70 that would be a – yeah, we would definitely have to promote that pretty aggressively.

Sarah Schoen: Thanks, Andy. Do we have any other questions coming in from participants? If you've got a question, ask it now, this is your chance. I think that we have covered everything, so if you think of a question later on, please don't hesitate to get in touch, send us an e-mail and we'll be in touch with the follow-up slides and recording, and if there's nothing else we will sign off at this point. Thanks again for joining us.

Andrew Mitchell: Thanks, Sarah.

[End of Audio]